

Notice of Allowability

Application No.

10/802,185

Examiner

Craig A. Thompson

Applicant(s)

CHENG ET AL.

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to IDS of 11/15/04.
2. ☒ The allowed claim(s) is/are 111-115, 117 and 118.
3. ☒ The drawings filed on 01 March 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 111504,060904,0426
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Craig A. Thompson
Primary Examiner
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EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Natasha Us on 1-5-2005.

The application has been amended as follows:

- Claim 115 has been rewritten as follows:

115. A semiconductor structure comprising:

a substrate comprising silicon;

an insulating layer disposed over the substrate; and

a relaxed $\text{Si}_{1-y}\text{Ge}_y$ layer disposed over and in contact with the insulating layer,

wherein a Ge concentration y of the relaxed layer is selected from the range of greater than zero to 1.

- Claim 116 is cancelled.
- In claim 117: "116" has been deleted and - - 115 - - has been inserted therefor.

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

Prior art of record does not describe or suggest applicants' invention set forth in claims 111-114, a semiconductor structure comprising a substrate including an insulating layer, and a device layer over the insulator, the device layer comprising at least one of strained Si, strained $\text{Si}_{1-w}\text{Ge}_w$, strained Ge, GaAs, ZnSe, and InGaP. Similarly, prior art of record does not describe or suggest the invention of claims 115 and 117-118 as amended above, a semiconductor substrate comprising: a substrate comprising silicon; an insulating layer disposed over the substrate; and, a relaxed $\text{Si}_{1-y}\text{Ge}_y$ layer disposed over and in contact with the insulating layer, wherein a Ge concentration y of the relaxed layer is selected from the range of greater than zero to 1.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Cited Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tezuka et al. (US Patent No. 5,923,046) teaches a quantum dot structure (abstract and title). One embodiment teaches forming a relaxed SiGe layer, but teaches forming it on the Si thin film material and not directly on the insulator layer (see column 13, lines 8-27). Powell (1994 AIP

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article) teaches growing relaxed SiGe, but again teaches depositing it on silicon and not directly on the insulator (abstract and page 1856 generally). Japanese abstracted publication JP409219524A teaches relaxed SiGe on an SOI layer (see solution) but does not teach forming the SiGe on the insulator directly. Furthermore, the Japanese patent document publication (as provided herewith in Japanese) is discussed below.

Regarding Japanese Patent Publication No. 9-219524 ('524)

In a telephone conversation with Natasha Us on 1/7/2005, the '524 reference was discussed in view of the pending claims and (at-that-time-proposed) amendment provided above. With respect to the publication, agreement was reached that: the front figure (of Figure 9) clearly discloses that the SiGe layer (4) is formed on the silicon layer (2) and not over and in contact with the insulating layer (3). Furthermore whereas the SiGe material (4) contacts the insulator (3) it would be compressively strained, not relaxed, and furthermore is not, in fact, disposed over and in contact with the insulating layer. Finally, not only does '524 not teach the claims allowed here, it also does not, even in conjunction with the relevant prior art, render them obvious.

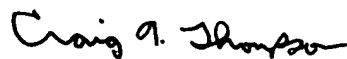
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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig A. Thompson whose telephone number is (571)272-1699. The examiner can normally be reached on Monday-Friday 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on (571)272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Craig A. Thompson
Primary Examiner
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1/7/2005